List of Claims

52. (New) A method for inducing anti-FAFSD peptide antibody production in a mammal by administering to said mammal a pharmaceutical composition comprising an immunologically effective amount in the range of 0.25 µg to 1 mg per kilogram body weight per dose of a peptide immunogen comprising a carrier protein covalently attached to a FAFSD target peptide selected from the group consisting of SEQ ID Nos: 4, 6 and 8.

53. (New) A method according to claim 52 wherein the FAFSD target peptide is an analogue thereof that is a crossreactive and immunologically functional analogue for FimH of fibriae E. coli and is selected from the group consisting of SEQ ID NOs: 5, 7, 86, 87 and 88.

54. (New) A method according to claim 52 wherein the FAFSD target peptide is cyclized.

55. (New) A method according to claim 53 wherein the FAFSD target peptide is cyclized.

56. (New) A method for inducing anti-FAFSD peptide antibody production in a mammal by administering to said mammal a pharmaceutical composition comprising an immunologically effective amount in the range of 0.25 µg to 1 mg per kilogram body weight per dose of a target peptide immunogen represented by the formulas

$$(A)_n\text{-(FAFSD peptide)-}(B)_o\text{-}(Th)_m\text{-X}$$
or
$$(A)_n\text{-}(Th)_m\text{-}(B)_o\text{-(FAFSD peptide)-X}$$
or
$$\text{(FAFSD peptide)-}(B)_o\text{-}(Th)_m\text{-}(A)_n\text{-X}$$
or
$$(Th)_m\text{-}(B)_o\text{-(FAFSD peptide)-}(A)_n\text{-X}$$

wherein:

each A is independently an amino acid or an invasin domain, SEQ NO:72;

each B is independently an amino acid or a chemical linker chosen from the group consisting of: amino acids, gly-gly, (α, ε-N) Lys, Pro-Pro-Xaa-Pro-Xaa-Pro (SEQ ID NO:73); $NHCH(X)CH_2SCH_2CO$-, -$NHCH(X)CH_2SCH_2CO(\varepsilon$-N)Lys-,-$NHCH(X)CH_2S$-succinimidyl($\varepsilon$-N)Lys-, and -$NHCH(X)CH_2S$-(succinimidyl)-;

each Th is independently a sequence of amino acids that constitutes a helper T cell epitope, or an immune enhancing analog or segment thereof;

The FAFSD peptide is selected from the group consisting of SEQ ID NOS: 3, 6 and 8;

X is α-COOH or α-$CONH_2$;

n is from 0 to about 10;

m is from 1 to about 4; and

o is from 0 to about 10.

57. (New) A method according to claim 56 wherein B is an amino acid selected from the group consisting of natural and unnatural amino acids.

58. (New) A method according to claim 56 wherein said Th is a combinatorial Th epitope library.

59. (New) A method according to claim 56 wherein said Th has an amino acid sequence selected from the group consisting of SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NOS:38-39, and SEQ ID NOS:49-50, and SEQ ID NO:67.

60. (New) A method according to claim 56 wherein said peptide immunogen has an amino acid sequence selected from the group consisting of SEQ

ID NOs:74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84 and 85.

61. (New) A method according to claim 56 wherein at least one A is an invasin domain.

62. (New) A method according to claim 56 wherein n is 3, and $(A)_3$ is (invasin domain)-Gly-Gly.

63. (New) A method for reducing adherence to the urinary tract mucosa of a mammal by type 1 fimbriated uropathogenic enterobacteriae to prevent urinary tract infection by administering to the mammal a pharmaceutical composition comprising an immunologically effective amount in the range of 0.25 μg to 1 mg per kilogram body weight per dose of a peptide immunogen comprising a carrier protein covalently attached to a FAFSD target peptide selected from the group consisting of SEQ ID Nos: 4, 6 and 8.

64. (New) A method according to claim 63 wherein the FAFSD target peptide is an analogue thereof that is a crossreactive and immunologically functional analogue for FimH of fibriae E. coli and is selected from the group consisting of SEQ ID NOs: 5, 7, 86, 87 and 88.

65. (New) A method according to claim 63 wherein the FAFSD target peptide is cyclized.

66. (New) A method according to claim 64 wherein the FAFSD target peptide is cyclized.

67. (New) A method for reducing adherence to the urinary tract mucosa of a mammal by type 1 fimbriated uropathogenic enterobacteriae to prevent urinary tract infection by administering to the mammal a pharmaceutical composition comprising an immunologically effective amount in the range of 0.25 μg to 1 mg per kilogram body weight per dose of a target peptide immunogen represented by the formulas

$(A)_n$-(FAFSD peptide)-$(B)_o$-$(Th)_m$-X
or
$(A)_n$-$(Th)_m$-$(B)_o$-(FAFSD peptide)-X
or
(FAFSD peptide)-$(B)_o$-$(Th)_m$-$(A)_n$-X
or
$(Th)_m$-$(B)_o$-(FAFSD peptide)-$(A)_n$-X

wherein:

each A is independently an amino acid or an invasin domain with amino acid sequence of SEQ NO:72;

each B is independently an amino acid or a chemical linker chosen from the group consisting of: amino acids, gly-gly, (α, ε-N) Lys, Pro-Pro-Xaa-Pro-Xaa-Pro (SEQ ID NO:73); $NHCH(X)CH_2SCH_2CO$-, -$NHCH(X)CH_2SCH_2CO$(ε-N)Lys-,-$NHCH(X)CH_2S$-succinimidyl(ε-N)Lys-, and -$NHCH(X)CH_2S$-(succinimidyl)-;

each Th is independently a sequence of amino acids that constitutes a helper T cell epitope, or an immune enhancing analog or segment thereof;

The FAFSD peptide is selected from the group consisting of SEQ ID NOS: 3, 6 and 8;

X is α-COOH or α-$CONH_2$;

n is from 0 to about 10;

m is from 1 to about 4; and

o is from 0 to about 10.

68. (New) A method according to claim 67 wherein B is an amino acid selected from the group consisting of natural and unnatural amino acids.

69. (New) A method according to claim 67 wherein said Th is a combinatorial Th epitope library.

70. (New) A method according to claim 67 wherein said Th has an amino acid sequence selected from the group consisting of SEQ ID NO:9, SEQ

ID NO:10, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NOS:38-39, and SEQ ID NOS:49-50, and SEQ ID NO:67.

71. (New) A method according to claim 67 wherein said peptide immunogen has an amino acid sequence selected from the group consisting of SEQ ID NOs:74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84 and 85.

72. (New) A method according to claim 67 wherein at least one A is an invasin domain.

73. (New) A method according to claim 67 wherein n is 3, and $(A)_3$ is (invasin domain)-Gly-Gly.

74. (New) A method according to claim 63 wherein the enterobacteriae is E. coli.

75. (New) A method according to claim 64 wherein the enterobacteriae is E. coli.

76. (New) A method according to claim 65 wherein the enterobacteriae is E. coli.

77. (New) A method according to claim 66 wherein the enterobacteriae is E. coli.

78. (New) A method according to claim 67 wherein the enterobacteriae is E. coli.

79. (New) A method according to claim 68 wherein the enterobacteriae is E. coli.

80. (New) A method according to claim 69 wherein the enterobacteriae is E. coli.

81. (New) A method according to claim 70 wherein the enterobacteriae is E. coli.

82. (New) A method according to claim 71 wherein the enterobacteriae is E. coli.

83. (New) A method according to claim 72 wherein the enterobacteriae is E. coli.

84. (New) A method according to claim 73 wherein the enterobacteriae is E. coli.